covalently coupled to said solid support, said tag is covalently coupled to said cleavable functional group, and said reactive group is covalently coupled to said tag and wherein said cleavable functional group, said tag and said reactive group are positioned relative to each other to allow transfer of said tag to said sample molecule and release of said sample molecule from said solid support upon cleavage of said cleavable functional group.

94. (Amended) A composition comprising a solid support covalently coupled to a chemical group comprising a cleavable functional group, a mass spectrometry tag and a reactive group for covalently attaching a sample molecule, wherein said cleavable functional group is covalently coupled to said solid support, said tag is covalently coupled to said cleavable functional group, and said reactive group is covalently coupled to said tag and wherein said cleavable functional group, said tag and said reactive group are positioned relative to each other to allow transfer of said tag to a sample molecule attached to said reactive group upon cleavage of said cleavable functional group and release of said sample molecule from said solid support.

Please add the following new claims.

106. (New) The composition of claim 76, wherein said cleavable group is a photocleavable group, said functional group

is a mass tag, and said reactive group reacts with a sulfhydryl group.

107. (New) The composition of claim 106, wherein said sample molecule is selected from the group consisting of a polypeptide, a nucleic acid, a lipid, a second messenger, and a metabolite.

108. (New) The composition of claim 107, wherein said sample molecule is a polypeptide.

109. (New) The composition of claim 108, wherein said polypeptide has a modification selected from the group consisting of phosphorylation, glycosylation, ubiquitination, acetylation, palmitylation, prenylation, sulfation, hydroxylation, and myristylation.

110. (New) The composition of claim 109, wherein said polypeptide is a phosphopolypeptide.

111. (New) The composition of claim 106, wherein the solid support is a glass bead.

112. (New) The composition of claim 106, wherein said mass tag is an amino acid.

113. (New) The composition of claim 112, wherein said mass tag is leucine.

114. (New) The composition of claim 106, wherein said mass tag is selected from the group consisting of a stable isotope tag, an isotope distribution tag, and a charged amino acid.

115. (New) The composition of claim 114, wherein said mass tag is a stable isotope coded amino acid.

116. (New) The composition of claim 115, wherein said mass tag is a deuterated or non-deuterated amino acid.

117. (New) The composition of claim 106, wherein said mass tag comprises an element having a characteristic isotope distribution.

118. (New) The composition of claim 106, wherein said reactive group is an iodoacetyl group.

119. (New) The composition of claim 106, wherein said photocleavable group comprises amino(ethyl)-2-methoxy-5-nitrophenoxy.

120. (New) The composition of claim 108, wherein a primary amine group of said polypeptide is modified by treatment with N-succinimidyl S-acetylthioacctate, hydroxylamine, and tris(2-carboxyethyl)phosphine.

121. (New) A composition comprising a solid support coupled to a chemical group comprising the cleavable functional

group, tag and reactive group shown in Figure 1, wherein the leucine tag is an isotope tag and wherein said reactive group is covalently linked to a sample molecule.

122. (New) The composition of claim 121, wherein said sample molecule is selected from the group consisting of a polypeptide, a nucleic acid, a lipid, a second messenger, and a metabolite.

123. (New) The composition of claim 122, wherein said sample molecule is a polypeptide.

124. (New) The composition of claim 123, wherein said polypeptide has a modification selected from the group consisting of phosphorylation, glycosylation, ubiquitination, acetylation, palmitylation, prenylation, sulfation, hydroxylation, and myristylation.

125. (New) The composition of claim 124, wherein said polypeptide is a phosphopolypeptide.

126. (New) The composition of claim 121, wherein the solid support is a glass bead.

127. (New) The composition of claim 123, wherein a primary amine group of said polypeptide is modified by treatment with N-succinimidyl S-acetylthioacctate, hydroxylamine, and tris(2-carboxyethyl)phosphine.

128. (New) The composition of claim 94, wherein said cleavable group is a photocleavable group, said functional group is a mass tag, and said reactive group reacts with a sulfhydryl group.

129. (New) The composition of claim 128, wherein the solid support is a glass bead.

130. (New) The composition of claim 128, wherein said mass tag is an amino acid.

131. (New) The composition of claim 130, wherein said mass tag is leucine.

132. (New) The composition of claim 128, wherein said mass tag is selected from the group consisting of a stable isotope tag, an isotope distribution tag, and a charged amino acid.

133. (New) The composition of claim 132, wherein said mass tag is a stable isotope coded amino acid.

134. (New) The composition of claim 133, wherein said mass tag is a deuterated or non-deuterated amino acid.

135. (New) The composition of claim 128, wherein said mass tag comprises an element having a characteristic isotope distribution.

136. (New) The composition of claim 128, wherein said reactive group is an iodoacetyl group.

137. (New) The composition of claim 128, wherein said photocleavable group comprises amino(ethyl)-2-methoxy-5-nitrophenoxy.

138. (New) A composition comprising a solid support coupled to a chemical group comprising the cleavable functional group, tag and reactive group shown in Figure 1, wherein the leucine tag is an isotope tag.

139. (New) The composition of claim 138, wherein the solid support is a glass bead.

140. (New) The composition of claim 138, wherein the leucine tag contains deuterium.

141. (New) A method of labeling a sample molecule, comprising contacting a sample with the composition of claim 138 under conditions allowing said sample molecule to covalently bind to said reactive group, and cleaving said cleavable function group, thereby releasing a sample molecule labeled with said tag.

142. (New) A pair of compounds each of which comprises a solid support coupled to a chemical group, said chemical group comprising the cleavable functional group, tag and reactive group shown in Figure 1, wherein said pair of compounds are differentially isotopically labeled on the leucine tag.